# ADM1023

## ACPI-C a , H Acc ac M c ce S y e Te e a e M

Features

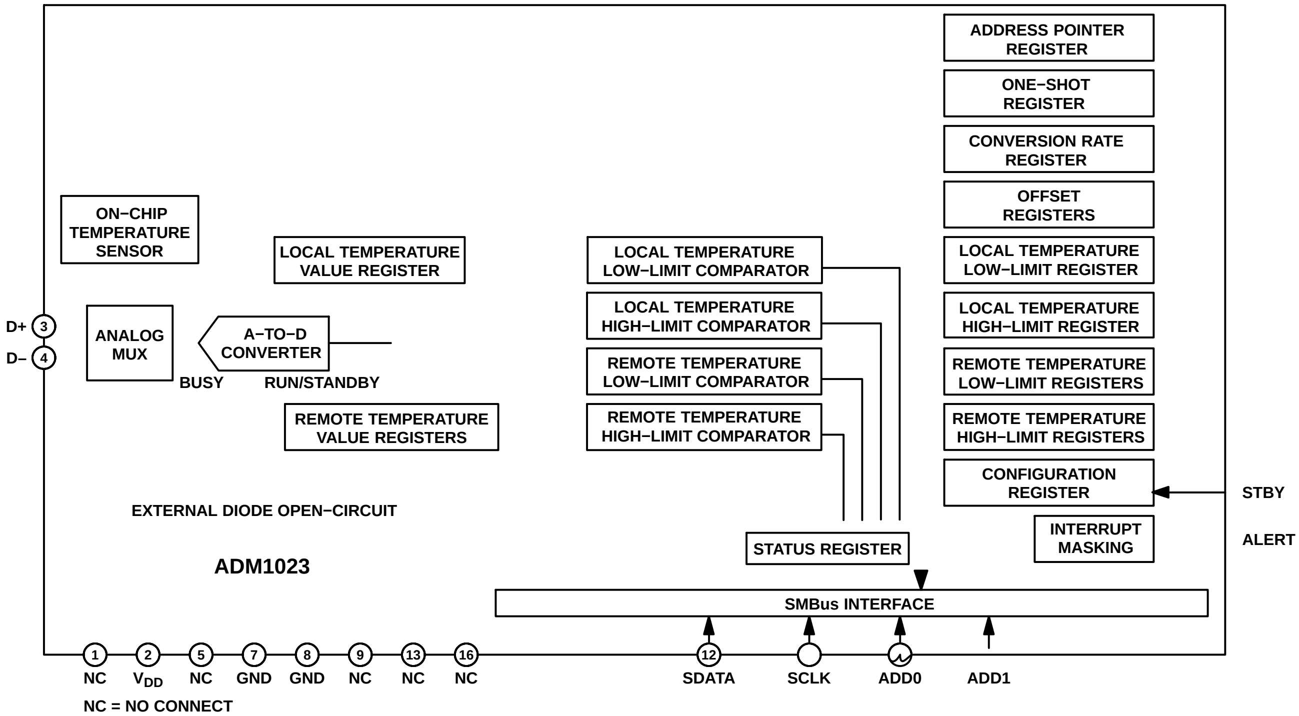


**Figure 1. Functional Block Diagram**

**Table 4. ELECTRICAL CHARACTERISTICS** ($T_A = T_{MIN}$ to $T_{MAX}$, $V_{DD}$ = 3.0 V to 3.6 V, unless otherwise noted. (Note 1)

| Parameter | Test Conditions/Comments | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **SMBus Interface** (See Figure 2) | | | | | |
| Logic Input High Voltage, $V_{IH}$ $\overline{STBY}$, SCLK, SDATA | $V_{DD}$ = 3.0 V to 5.5 V | 2.2 | | | |

## TYPICAL PERFORMANCE CHARACTERISTICS

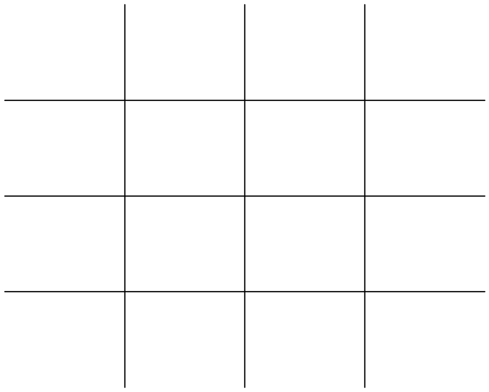

Figure 9. Temperature Error vs. Differential-mode Noise Frequency

Figure 10. Operating Supply Current vs. Conversion Rate, $V_{DD}$ = 5.0 V and 3.3 V

Figure 11. Standby Supply Current vs. Supply Voltage

Figure 12. Response to Thermal Shock

## Theory of Operation

### Functional Description

### Temperature Data Format

**Table 5. TEMPERATURE DATA FORMAT (LOCAL AND REMOTE TEMPERATURE HIGH BYTE)**

| **Temperature (°C)** (Note 1) | **Digital Output** |
|---|---|
| 0 | 0 000 0000 |
| 1 | 0 000 0001 |
| 10 | 0 000 1010 |
| 25 | 0 001 1001 |
| 50 | 0 011 0010 |
| 75 | 0 100 1011 |
| 100 | 0 110 0100 |
| 125 | 0 111 1101 |
| 127 | 0 111 1111 |

1. The ADM1023 differs from the ADM1021 in that the temperature resolution of the remote channel is improved from 1 C to 0.125 C, but it cannot measure temperatures below 0 C. If negative temperature measurement is required, the ADM1021 should be used.

**Table 7. LIST OF ADM1023 REGISTERS**

| Read Address (Hex) | Write Address (Hex) | Name | Power-on Default |
|---|---|---|---|
| Not Applicable | Not Applicable | Address Pointer | Undefined |
| 00 | Not Applicable | Local Temperature Value | 1000 0000 (0x80) (−128 C) |
| 01 | Not Applicable | Remote Temperature Value High Byte | 1000 0000 (0x80) (−128 C) |
| 02 | Not Applicable | Status | Undefined |
| 03 | 09 | Configuration | 0000 0000 (0x00) |
| 04 | 0A | Conversion Rate | 0000 0010 (0x02) |
| 05 | 0B | Local Temperature High Limit | 0111 1111 (0x7F) (+127 C) |
| 06 | 0C | Local Temperature Low Limit | 1100 1001 (0xC9) (−55 C) |
| 07 | 0D | Remote Temperature High Limit High Byte | 0111 1111 (0x7F) (+127 C) |
| 08 | 0E | Remote Temperature Low Limit High Byte | 1100 1001 (0xC9) (−55 C) |
| Not Applicable | 0F (Note 1) | One-shot | |

[redacted]

**Table 9. STATUS REGISTER BIT ASSIGNMENTS**

| Bit | Name | Function |
|---|---|---|
| 7 | | |

**Table 12. DEVICE ADDRESSES** (Note 1)

| ADD0 | ADD1 | Device Address |
|---|---|---|
| 0 | 0 | 0011 000 |
| 0 | NC | 0011 001 |
| 0 | 1 | 0011 010 |
| NC | 0 | 0101 001 |
| NC | NC | 0101 010 |
| NC | 1 | 0101 011 |
| 1 | 0 | 1001 100 |
| 1 | NC | 1001 101 |
| 1 | 1 | 1001 110 |

1. ADD0 and ADD1 are sampled at powerup only.

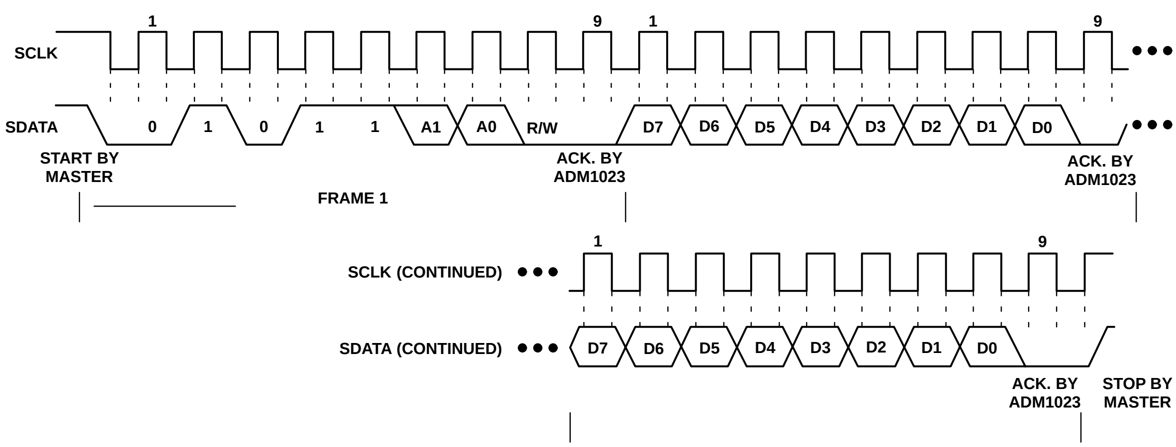


**Figure 15. Writing a Register Address to the Address Pointer Register, then Writing Data to the Selected Register**

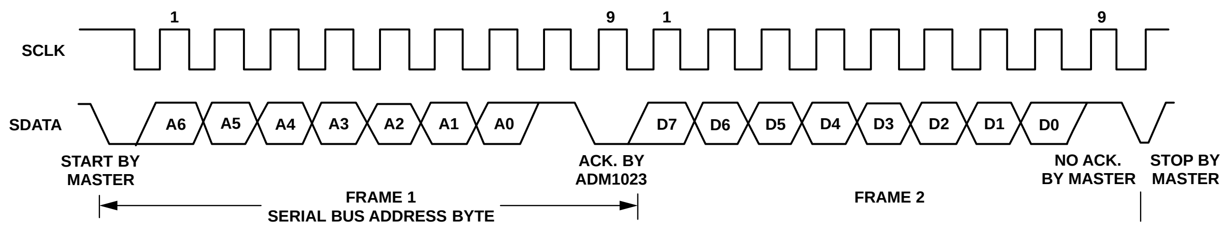


**Figure 17. Reading Data from a Previously Selected Register**

**QSOP16**
CASE 492−01
ISSUE A

DATE 23 MAR 2011

**SCALE 2:1**